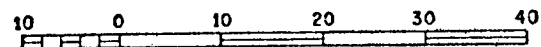


# BIG SANDY RIVER



GRAPHIC SCALE IN MILES

Base Data: U. S. Geological Survey

## THE BIG SANDY RIVER BASIN

The Big Sandy River Basin is the eastern most river basin in Kentucky. This basin is part of the most mountainous section of Kentucky. The first section of this report will deal with the general description of the area, both physical and population. The second section will enter into an analysis of the water quality in the basin, its causes and effects.

### I. A Description of the Big Sandy River Basin

#### A. Geography

The Big Sandy River Basin lies in the states of Kentucky, West Virginia and Virginia. That portion of the basin which lies in Kentucky is bordered on the east by the Kentucky-West Virginia border, to the south by the Kentucky-Virginia border, and on the west by the Kentucky, Licking and Little Sandy River Basins. The western border runs through eastern Letcher County, Knott County, eastern Magoffin County, northwestern Johnson County, northwestern Lawrence County and Boyd County.

The main stem of the Big Sandy River is formed by the junction of the Tug and Levisa Forks at Louisa, Kentucky and flows northerly 27 miles to enter the Ohio River about 10 miles downstream from Huntington, West Virginia. This river enters the Ohio River 664.3 miles from the Mississippi River. It drains 4,280 square miles of which 2,285 are drained in Kentucky. The Levisa Fork rises in southwest Virginia and flows north for 34 miles in Virginia and 130 miles in Kentucky to Louisa. The Tug Fork rises in southwestern West Virginia and flows northwest about 60 miles to Kentucky, whence it forms the boundary between Kentucky and West Virginia for about 94 miles. Principal tributaries of Levisa Fork are Russell Fork (127 sq. mi.), Beaver Creek (92 sq. mi.), and Johns Creek (74 sq. mi.). There are no significant tributaries to the Tug Fork in Kentucky.

## B. Topography

The character of land in the Big Sandy River Basin varies from mountainous terrain in its upper portions to hilly areas along the Big Sandy River. Over most of the area, the streams and their tributaries flow in deep, narrow, sinuous valleys between the steep-sided ridges. In the headwaters, the terrain includes the deepest gorge in the southeastern United States while in the lower portions of Boyd and Lawrence Counties the valleys are relatively wide with gently sloping hills. Physiographically, the Big Sandy River is wholly within the Appalachian Plateau.

The elevation of the Big Sandy River ranges from 2,400 feet above mean sea level (m.s.l.) (Levisa Fork) and 2,200 feet above m.s.l. (Tug Fork) at its headwaters to 498 feet above m.s.l. at its mouth on the Ohio River.

Slope, directly relates to the reaeration rate of a stream. With slopes from 0-2 ft./mi. the reaeration is low. Slopes from 3-6 ft./mi. give a medium reaeration while slopes of 7-10 ft./mi. give a high reaeration. The average slope of the Big Sandy River is 9.9 ft./mi. Slopes of the main stem, Levisa Fork below Russell Fork, and the lower 65 miles of Tug Fork average 1.3 to 2.3 ft./mi.

Many of the tributaries have a much greater average slope than the main stem. Russell Fork has an average slope of 24.9 ft./mi., Beaver Creek has an average slope of 34.3 ft./mi., Pigeon Creek has an average slope of 32.9 ft./mi., Big Creek has an average slope of 57.3 ft./mi., Peter Creek has an average slope of 63.0 ft./mi. Several other streams have average slopes of over 50 ft./mi.

### C. Geology

The Big Sandy River Basin itself is not generally conducive for agricultural practices except for timber production. Generally, the soil is of limited depth, the land is steep and subject to erosion from runoff and wind. The principal geological feature of this area which directly and indirectly contributes to the water quality is the coal resource. The coal from this region is generally of metallurgical grade and suitable for production of coke. The coal has a low ash, low sulfur content and a high BTU value. The Big Sandy gas field is located in the area of the Tug and Levisa Forks. Scattered throughout the area are several small petroleum fields.

Because of the geology, the surface water of the Big Sandy River Basin is mainly sulfate-bicarbonate type with some chloride effects from oil fields in the extreme northern area around Blaine Creek and Louisa.

Aquifers are underground layers of porous rock from which groundwater is obtained. Two types of aquifers are found in the portion of the Big Sandy River Basin below the confluence of the Tug and Levisa Forks. On the eastern part of the basin, near the river, the aquifer yield is 500-1,000 gallons per minute (g.p.m.) while to the west the yield is 50 or less g.p.m. Above the confluence of the Tug and Levisa Forks, the groundwater resource is characterized by the potential yield of the aquifers as follows: approximately 50 per cent of the area will produce 50 or less g.p.m., 48 per cent of the area will produce 50-500 g.p.m., and 2 per cent of the area will produce 400-1,000 g.p.m.

### D. Hydrology

The stream flow of the Big Sandy Basin is shown from three gauging station records: the Big Sandy River at Louisa and the Levisa Fork at Prestonsburg and at Paintsville. The flow record summary includes drainage area, average flow, maximum and minimum flow and 7 day 10 year flow.

There are no active locks and dams on the main stem of the Big Sandy. In Kentucky the Corps has constructed two impoundments (Dewey and Fishtrap Lakes) on the Levisa Fork. The water surface totals 2,231 acres with a pool capacity of 103,000 acre feet. Both Dewey Lake and Fishtrap Lake are used for flood control, fish and wildlife, and recreation. Fishtrap Dam is also used for low flow augmentation (190 cubic feet per second).

#### E. Population

The population of the Big Sandy River Basin is basically rural in nature. Farms and towns are situated closely along the main stem and tributaries. The majority of population is located near the headwaters with 61,000 people residing in Pike County, 35,000 in Floyd County, and 17,000 in Johnson County. The main cities are Paintsville (Johnson) with a population of 7,300, Prestonsburg (Floyd) with 6,100, and Pikeville (Pike) with 4,900. The largest city near the mouth is Catlettsburg (Boyd County) with 3,400 people.

TABLE J-4

## SURFACE WATER RECORDS FOR THE BIG SANDY RIVER BASIN

STATION	PERIOD OF RECORD	DRAINAGE AREA	AVERAGE FLOW	MAXIMUM FLOW	MINIMUM FLOW	7-day/10-yr. LOW FLOW
Levisa Fork at Prestonsburg **	12 yr.	1,701 sq.mi.	2,161 cfs, $\frac{1.3\text{cfs}}{\text{sq.mi.}}$ *	44,000 cfs, $\frac{26\text{cfs}}{\text{sq.mi.}}$	20 cfs, $\frac{0.0\text{cfs}}{\text{sq.mi.}}$	206 cfs
	wtr/yr 1975		3,201 cfs, $\frac{1.9\text{cfs}}{\text{sq.mi.}}$	28,000 cfs, $\frac{16\text{cfs}}{\text{sq.mi.}}$	197 cfs, $\frac{0.1\text{cfs}}{\text{sq.mi.}}$	
Levisa Fork at Paintsville ***	48 yr.	2,143 sq.mi.	2,491 cfs, $\frac{1.2\text{cfs}}{\text{sq.mi.}}$	69,700 cfs, $\frac{33\text{cfs}}{\text{sq.mi.}}$	8.4 cfs, $\frac{0.0\text{cfs}}{\text{sq.mi.}}$	210 cfs
	wtr/yr 1975		4,234 cfs, $\frac{2.0\text{cfs}}{\text{sq.mi.}}$	31,700 cfs, $\frac{15\text{cfs}}{\text{sq.mi.}}$	253 cfs, $\frac{0.1\text{cfs}}{\text{sq.mi.}}$	
Big Sandy at Louisa ***	37 yr.	3,892 sq.mi.	4,452 cfs, $\frac{1.1\text{cfs}}{\text{sq.mi.}}$	89,400 cfs, $\frac{23\text{cfs}}{\text{sq.mi.}}$	Not determined	242 cfs
	wtr/yr 1975		7,354 cfs, $\frac{1.9\text{cfs}}{\text{sq.mi.}}$	57,700 cfs, $\frac{15\text{cfs}}{\text{sq.mi.}}$	479 cfs, $\frac{0.1\text{cfs}}{\text{sq.mi.}}$	

\* Cubic feet per second

\*\* Flow regulated since October, 1968 by Fishtrap Lake, since August, 1966 by North Fork Pound River Lake, and since March, 1965 by John W. Flannagan Lake.

\*\*\* Flow regulated since October, 1968 by Fishtrap Lake, since August, 1966 by North Fork Pound River Lake, since March, 1965 by John W. Flannagan Lake, and since May, 1950 by Dewey Lake.

NOTE: Data is taken from "Surface Water Records in Kentucky" by the United States Geological Survey. The 7-day/10-yr. low flow was taken from the waste load allocation produced as a component of the 303e River River Basin Continuing Planning Process.

## II. Basin Water Quality

The basic recorded water quality of the basin is presented along with some of the major causes and effects. Also presented are the major users of surface water in the basin.

### A. Description of Water Sampling Station

The U.S.G.S. station and Kentucky Water Quality Station, from which data in the following two sections was collected, are both located near Louisa, Kentucky in Lawrence County on the main stem of the Big Sandy River. The area of the basin above the stations is approximately 3,890 sq./mi., which is approximately 91% of the total basin area.

### B. General Chemical Water Quality

The chemical composition of water is best defined by grouping dissolved elements which compose the total dissolved solids. By examining the relationships of groups of chemicals, the type of water whether hard or soft, salty, acid or high in sulfates reflects the mix of surface and groundwater. The chemical characteristics of a stream when viewed over a long period of time is primarily from surface water. The type of rock formation and soils which the surface water contacts causes the predominate chemical characteristics. This contribution of groundwater, which is generally higher in dissolved solids than surface water, can be shown by selecting the low flow period for data analyses. The general character of waters in Kentucky are ones which have moderate hardness caused by calcium and magnesium salts. The influence of mining activities are clearly indicated when the sulfate content increases to a higher level than the bicarbonate content, and the pH is on the acid side, below pH 5.5.

Oil field operations, when brine is encountered, are reflected by changes in sodium and chloride contents of the water. For Kentucky water, the influence

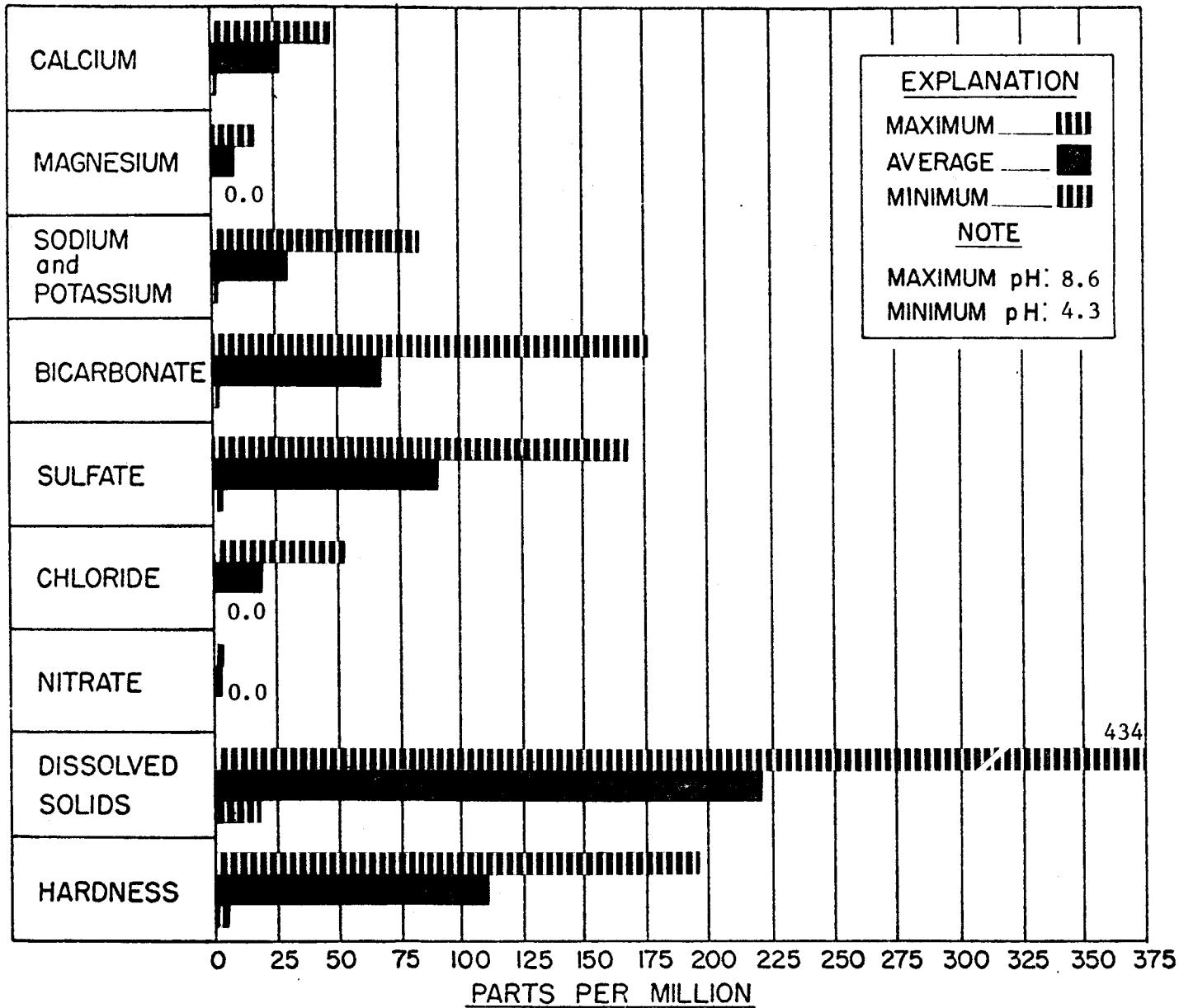


FIGURE J-1  
 Big Sandy River  
 Louisa  
 5-65 to 6-74

MAXIMUM, AVERAGE, and MINIMUM concentrations of dissolved constituents,



is pronounced when either chloride or sodium exceeds 20-25 parts per million as an average value. The water quality data is summarized in Table J-8 and a graph is presented to show the general chemical water quality. In the Big Sandy River Basin, the water is moderately hard in general but has ranged from soft to very hard at times. The sulfate content is, on an average, 30 per cent higher than the bicarbonate level in the streams. The pH, on an average, is within Kentucky Water Quality Standards (6-9), however, it has dropped to a recorded low of 4.3. These relationships reflect in part the influence of mining operation throughout a large portion of the basin.

The average concentration of sodium and chlorides in the stream indicates higher than expected levels which may be attributed to the activity of oil production from the Blaine Creek Basin.

#### C. Trace Chemical Water Quality

Trace elements (under 5 mg/l) are separated from the general chemical background of this report because of their influence on human health. Generally, these materials are "heavy" metals, which in sufficient concentrations have a toxic or otherwise adverse effect on human and animal or plant life. Levels for many of these elements have been established for years in the Drinking Water Standards and more recently through the State-Federal Water Quality Standards.

The trace chemicals measured in the Big Sandy River Basin are within Kentucky-Federal Water Quality Standards.

#### D. Waste Load Effect on Water Quality

Biochemical degradable wastes impose a load on the dissolved oxygen resources of a stream. Such waste loads are considered to have an adverse effect on water quality when they cause the D.O. concentration of the water to drop below the Kentucky water quality standard of 5.0 mg/l.

Waste load allocations were made for approximately 560 miles of streams using a model developed for the Kentucky Continuing Planning Process for River Basin Management Planning. The results show that approximately 250 miles would have a D.O. concentration of less than 5.0 mg/l when the flow is equal or less than the once in ten year, seven day low flow. This is attributed to the fact that in the Big Sandy Basin, the tributaries have zero flow during most years. On the main stem, approximately ten miles are affected while on the tributaries 240 miles will be affected, based on present treatment levels.

Of the stream length affected, 5 miles (2%) are affected by industry (mostly coal related), 10 miles (4%) by municipalities, and 235 miles (98%) by other discharges such as schools, trailer parks, subdivisions, etc.

The quantities of waste loads causing this effect are 80,000 gallons from industries and 520,000 gallons from municipalities.

#### E. Non-point Pollution

Major sources of non-point pollution of the basin's streams are coal mining and solid waste. Soil erosion from surface mined lands and forestland which has been harvested are the leading sources, followed by agricultural lands, roadbanks, streambanks, and developing areas are the main sources of sediment. Solid waste problems are a result of the lack of adequate facilities for collection and disposal of solid waste.

Areas which contribute to soil erosion are summarized as follows:

1. Strip mining, a major cause of sedimentation, is difficult to quantitate as to the area or amount. The impact in a selected area indicated the mining effects of underground and surface mining.

2. An estimated 380 sq./mi. (12% of total basin) of forest land have excessive erosion as a result of logging operations and forest fires.
3. About 4.7 sq./mi. (.2% of total basin) of cropland are eroding at rates exceeding acceptable levels.
4. About 1.6 sq./mi. (.07% of total basin) of critical area and 3,000 miles of roadbank are eroding excessively.

Most of the surface water withdrawn for usage in the Big Sandy River Basin is used for public water supply. Approximately 3.9 million gallons per day (m.g.d.) (71% of total) is withdrawn for public supply with 1.6 m.g.d. (29%) being withdrawn for industrial usage.

According to the Kentucky Department of Fish and Wildlife, the Big Sandy River Basin also includes approximately 770 linear miles of stream which have been found capable of supporting a stream fishery. Five streams (120 miles) are considered to be of outstanding quality. Streams of lesser quality total 460 miles and 190 miles have been affected by pollution. The primary form of this pollution is siltation from non-point sources.

#### G. Water Quality Change

The demand for coal and the expected output from Kentucky at three times the current level or approximately 400 million tons per year fore-shadows all other considerations of the Big Sandy River Basin. Even with a controlled program which can minimize the effects of sedimentation of surface mining and the effects of acid mine drainage from both surface or underground mining, water quality deterioration can be expected in the form of both siltation and a major modification of the general chemical water quality by adding to the total dissolved solids and changing the type of water from a bicarbonate to a sulfate type water.

### III. Summary - Water Quality Causes and Corrections

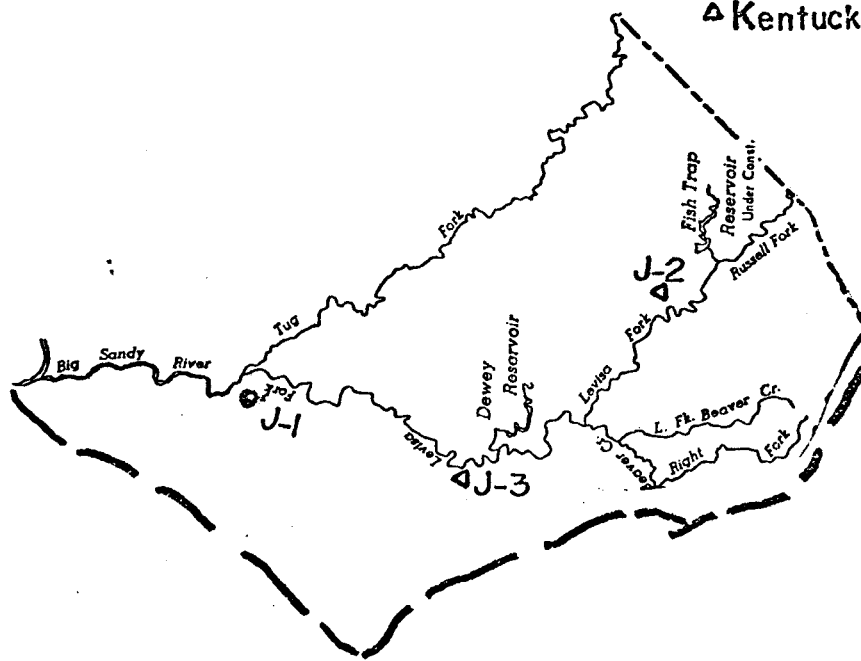
The two main problems in this basin in relation to water quality are from siltation and wasteloads.

Siltation is primarily from two aspects of the coal mine industry, logging and strip mining. Logging can result in high runoff rates and serious erosion while strip mining leads to sedimentation from upheaval of surface soil. With the increase in demand for coal due to the energy crisis, great care and vigilance will need to be exercised to see that this problem does not increase.

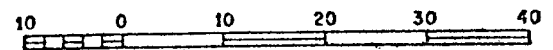
The problem organic discharges are from concerns such as schools, subdivisions, and trailer parks which are located on small tributaries where the low flow is often zero and the main part of the flow is often the effluent. This will be alleviated to a great extent by upgraded sewage treatment facilities.

○ U.S.G.S.

△ Kentucky Division of Water



## BIG SANDY RIVER



GRAPHIC SCALE IN MILES

Base Data: U. S. Geological Survey

## STATION KEY

- J-1 BIG SANDY RIVER AT LOUISA
- J-2 LEVISA FORK AT PIKEVILLE
- J-3 LEVISA FORK AT PAINTSVILLE

TABLE J-1  
Length and Drainage Areas of Streams in the  
Big Sandy Basin

<u>STREAM</u>	<u>MILES ABOVE MOUTH OF BIG SANDY RIVER</u>	<u>DRAINAGE AREA (square miles)</u>	<u>LENGTH IN MILES TO HEADWATERS</u>
Big Sandy River:			
Big Sandy River	0.0	4290.0	191.0
Blain Creek	19.6	265.0	51.3
Levisa Fork:			
Levisa Fork	26.8	2331.0	164.2
Paint Creek	65.4	168.7	34.0
Johns Creek	73.7	224.1	64.1
Middle Creek	81.8	65.0	17.1
Beaver Creek	91.8	240.2	46.0
Mud Creek	102.3	52.4	12.0
Shelby Creek	123.0	115.0	20.0
Russell Fork	127.2	678.5	44.9
Elkhorn Creek	138.9	53.4	20.5
Tug Fork:			
Tug Fork	26.8	1555.0	155.3
Rockcastle Creek	37.0	120.9	33.3
Wolf Creek	63.6	83.5	16.5
Big Creek	75.6	59.4	21.0
Pond Creek	84.7	40.7	13.5
Blackberry Creek	98.9	20.2	9.5
Peter Creek	104.5	34.5	13.5

TABLE J-2

County Areas in the  
BIG SANDY BASIN

<u>COUNTY</u>	<u>AREA IN SQUARE MILES (1)</u>	<u>PERCENT AREA IN BASIN (2)</u>	<u>AREA IN SQUARE MILES IN BASIN</u>
Boyd	159	27	43
Floyd	401	100	400
Johnson	264	100	260
Knott	356	28	100
Lawrence	425	92	390
Letcher	339	6	23
Magoffin	303	4	12
Martin	231	100	230
Morgan	369	10	37
Pike	786	100	790
			<u>2,285</u>

1. Area - U. S. Census - Source of Measurement Unknown - Approximately  $\pm$  10%
2. Percent in Basin - Federal Water Pollution Control Administration - Ohio River Basin Framework Comprehensive Study
3. USGS - Area 2,284 Square Miles - From 7.5 Minute Quadrangle Topographical Map

TABLE J-3.

## SLOPE CHARACTERISTICS OF BIG SANDY RIVER AND ITS PRINCIPAL TRIBUTARIES

<u>STREAM</u>	<u>Elevation at source (feet above m.s.l.)</u>	<u>Miles above mouth of Big Sandy River</u>	<u>Length of Stream (miles)</u>	<u>Average slope (ft./mi.)</u>
Big Sandy River	2400	0.0	191.0	9.9
A. Levisa Fork	2400	26.8	164.2	11.3
a. Russell Fork	1770	127.2	44.9	24.9
1. Pound River	2250	148.2	44.8	24.1
a. Cranesnest River	1620	154.7	24.2	13.6
b. McClure River	1620	151.5	21.0	17.6
b. Beaver Creek	1800	91.8	46.0	34.3
c. Johns Creek	1800	73.7	64.1	19.0
d. Paint Creek	1035	38.6	34.0	12.9
B. Tug Fork	2200	26.8	154.2	10.9
a. Rockcastle Creek	1050	37.0	33.3	15.3
b. Pigeon Creek	1600	68.4	30.4	32.9
c. Big Creek	1800	75.6	21.0	57.3
d. Peter Creek	1550	104.5	13.5	63.0
e. Knox Creek	1500	111.8	20.0	38.4
f. Dry Fork	2250	135.7	40.7	31.4
1. Big Creek	1700	161.1	14.4	55.5
g. Elkhorn Creek	2300	159.5	22.6	45.2
h. Panther Creek	1700	128.7	14.4	55.5
C. Blaine Creek	900	19.6	51.3	7.6

1/ Includes Levisa and Tug Forks.



TABLE J-5

LAKES OF KENTUCKY IN BIG SANDY RIVER BASIN  
OVER 100 ACRES OR 1000 ACRE-FEET

NAME	COUNTY	POOL CAPACITY (AF)	AREA (AC)
Dewey Lake	Floyd	76,100	1,100
Horseford Creek Dam	Lawrence	2,510	57
Jenkins Mine Refuse Dam (owned by Beth-Elkhorn Coal Company)	Letcher	2,600	30
Fishtrap Lake	Pike	27,190	1,130
McAndrews Refuse Dam (owned by Eastern Coal Company)	Pike	2,470	17

(AF) = Acre Feet

(AC) = Acres

Table J - 6

City Population and Facility Grant Status  
in the Big Sandy River Basin in Kentucky

County	City	Population	Project Type	Comments
Boyd	Catlettsburg	3,420	I	Underway
Floyd	Prestonsburg	6,100	I	Underway
	Wheelwright-	1,781	I	Underway
	Allen	724		
	Wayland	384		
	Martin	786		
Johnson	Paintsville- Van Lear	7,300	I	Underway
Lawrence	Louisa	1,781	I	Underway
Martin	Inez	566	I	Underway
	Martin Co W. D. #2		I	Underway
Pike	Pikeville	4,900	I	Underway
	Phelps	770	None	No sewers

NOTE: Project type is related to the type of grant applied for or received by each city. Type I is for preliminary studies necessary before design of the facility. Type II is the design phase of a facility and Type III is for the construction of a facility for the collection and treatment of domestic sewage.

The comments relate to the status of the grant. Underway indicates the project type is funded. Pending indicates that application for a grant has been made and is pending approval and no sewers means when a grant is requested that it is for a complete and original system.

The source of this information was the 1970 U. S Census and the FY 75 construction grants list for Kentucky.

TABLE J-7  
Population of the Big Sandy Basin

COUNTY	POPULATION IN 1970	POPULATION IN BASIN
Boyd	52,376	8,700
Floyd	35,889	35,889
Johnson	17,539	17,539
Knott	14,698	3,900
Lawrence	10,726	9,950
Letcher	23,165	3,800
Magoffin	10,443	380
Martin	9,377	9,377
Morgan	10,019	870
Pike	61,059	<u>61,059</u>
		TOTAL 151,000 (approximate)

Table J - 8

## Water Quality Data For Big Sandy River Basin

Station	Beg. Date	End Date	Mean	Max.	Min.	#OBS.	S
STORET #00400	pH Specific Units, Ky. std. 6 LT pH LT 9						
Big Sandy R - Louisa	75/01/16	75/12/11	7.3	8.1	6.7	11	.481
USGS 03215000	70/04/22	74/12/18	7.4	7.9	6.7	13	.368
	65/05/22	74/12/18	7.3	8.0	6.7	31	.353
STORET #00095	Conductivity Micro mhos Ky. std. 800 Micro mhos						
Big Sandy R - Louisa	75/01/16	75/12/11	360.5	550.0	205.0	11	127.6
USGS 03215000	70/03/11	74/12/18	360.0	580.0	150.0	27	137.1
	65/05/22	74/12/18	396.5	729.0	150.0	55	154.2
STORET #70300	Dissolved Solids mg/l Ky. std. 500 mg/l						
Big Sandy R - Louisa	75/01/16	75/10/15	216.4	338.0	118.0	9	83.8
USGS 03215000	70/04/22	74/12/18	212.5	346.0	99.0	13	80.0
	65/11/14	74/12/18	239.9	447.0	97.0	30	114.3
STORET #00410	Alkalinity mg/l No Standard						
Big Sandy R - Louisa	75/01/16	75/10/15	65.7	115.0	25.0	9	35.0
USGS 03215000	70/04/22	74/12/18	55.7	110.0	20.0	13	26.6
	65/05/22	74/12/18	58.5	123.0	20.0	25	31.6
STORET #00900	Hardness mg/l 0-60 soft, 60-120 mod.hard, 121-180 hard over 180 very hard						
Big Sandy R - Louisa	75/01/16	75/10/15	119.6	170.0	82.0	9	36.6
USGS 03215000	70/04/22	74/12/18	109.8	170.0	57.0	13	36.2
	65/05/22	74/12/18	117.5	196.0	50.0	31	41.0
STORET #00930	Sodium mg/l No Standard						
Big Sandy R - Louisa	75/01/16	75/10/15	26.5	48.0	7.6	9	16.2
USGS 03215000	70/10/14	74/12/18	30.0	54.0	12.0	5	18.9
	66/07/13	74/12/18	41.4	75.0	12.0	9	21.6
STORET # 00935	Potassium mg/l No Standard						
Big Sandy R - Louisa	75/01/16	75/10/15	2.8	3.8	1.8	9	.923
USGS 03215000	70.10/14	74/12/18	3.4	4.8	2.0	5	1.1
	66/07/13	74/12/18	3.7	5.1	2.0	9	1.0
STORET # 00940	Chloride mg/l Prop. E. P. A. Std. 250 mg/l						
Big Sandy R - Louisa	75/01/16	75/10/15	10.7	26.0	3.4	9	7.8
USGS 03215000	70/04/22	74/12/18	14.2	28.0	3.7	13	9.1
	65/05/22	74/12/18	19.2	52.0	3.7	31	14.3

Table J-8  
Continued

STORET # 00618	Nitrate - N mg/l Prop. E. P. A. Std. 10 mg/l							
Big Sandy R - Louisa	72/01/06	72/07/24	.48	.73	.20	3	.266	
USGS 03215000	66/10/11	72/07/24	.46	.73	.20	4	.219	
STORET #00950	Flouride mg/l Ky. Std. 1.0 mg/l							
Big Sandy R - Louisa	75/01/16	75/10/15	.14	.40	0.0	9	.142	
USGS 03215000	70/09/09	74/12/18	.13	.20	0.0	8	.071	
	65/11/14	74/12/18	.11	.2	0.0	15	.074	
STORET #00915	Calcium mg/l No Standard							
Big Sandy R - Louisa	75/01/16	75/10/15	28.9	41.0	19.0	9	9.5	
USGS 03215000	70/10/14	74/12/18	29.8	43.0	19.0	5	11.3	
	66/07/13	74/12/18	32.6	48.0	19.0	9	11.3	
STORET #00945	Sulfate mg/l Prop. E. P. A. Std. 250 mg/l							
Big Sandy R - Louisa	75/01/16	75/10/15	92.4	130.0	64.0	9	26.9	
USGS 03215000	70/04/22	74/12/18	100.7	169.0	37.0	31	36.6	
	65/05/22	74/12/18	100.7	169.0	37.0	31	36.6	
STORET #00925	Magnesium mg/l No Standard							
Big Sandy R - Louisa	75/01/16	75/10/15	11.5	17.0	7.6	9	3.2	
USGS 03215000	70/10/14	74/12/18	12.7	17.0	8.3	5	3.9	
	66/07/13	74/12/10	13.3	17.0	8.3	9	3.4	
STORET #00080	Color Platinum - Colbart Units Prop. EPA Std. 75 Units							
Big Sandy R - Louisa	70/10/14	70/10/14	5.0	5.0	5.0	1	--	
USGS 03215000	65/05/22	70/10/14	5.7	10.0	4.0	6	2.1	
STORET # 01025	Cadmium Micrograms/Liter Ky. Std. 100 ug/l							
Big Sandy R - Louisa	75/01/16	75/07/09	1.0	2.0	0.0	4	.816	
USGS 03215000	74/04/07	74/10/23	1.2	3.0	0.0	5	1.0	
STORET #01056	Manganese ug/l Prop. Ky. Std. 50 ug/l							
Big Sandy R - Louisa	75/01/16	75/07/09	13.3	30.0	0.0	3	15.2	
USGS 03215000	74/10/23	74/10/23	17.0	17.0	17.0	1	--	
STORET # 01046	Iron ug/l Prop. E. P. A. Std. 300 ug/l							
Big Sandy R - Louisa	75/01/16	75/07/09	550.0	1600.0	9.9	3	909.4	
USGS 03215000	74/10/23	74/10/23	0.0	0.0	0.0	1	--	
STORET # 01030	Chromium ug/l Ky. Std. 50 ug/l							
Big Sandy R - Louisa	75/01/16	75/07/09	.75	2.0	0.0	4	.957	
USGS 03215000	74/04/07	74/10/23	.8	3.0	0.0	5	1.3	

## Continued

STORET #01049	Lead ug/l	Ky. Std. 50 ug/l					
Big Sandy R - Louisa	75/01/16	75/07/09	3.25	10.0	0.0	4	4.7
USGS 03215000	74/04/07	74/10/23	8.6	17.0	2.0	5	7.3

STORET #01000	Arsenic ug/l	Ky. Std. 50 ug/l					
Big Sandy R - Louisa	75/01/16	75/07/09	.25	1.0	0.0	4	.5
USGS 03215000	74/04/07	74/10/23	3.0	9.0	0.0	5	3.7

Bacteriological Data							
STORET #31503	Total Coliform Colonies per 100 ml	Ky. Std. 1000/100ml					
STORET #31616	Fecal Coliform Colonies per 100 ml						

Levisa Fork Pikeville							
T Coliform	75/02/19	75/10/30	13681	65000		10	7

F Coliform	75/20/19	75/07/30	5256	2400		0	5
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Levisa Fork, Paintsville							
T Coliform	75/02/19	75/10/30	7387	15000		8	8
	75/02/19	75/10/30	7387	1220		8	8

F Coliform	72/02/19	75/07/30	830	1220		450	5
	72/02/19	75/07/30	830	1220		450	5

## Water Withdrawal - Big Sandy Basin

(Million Gallons/Day)

	<u>WATER USAGE</u>	<u>SW *</u>	<u>GW **</u>	<u>PUBLIC</u>	<u>INDUSTRIAL</u>
<u>BOYD</u>					
Catlettsburg, Kenova, Ceredo Water Co., Inc.	Big Sandy	x		1.081	.033
Calgon Corporation	Big Sandy	x	x		.007 GW .432 SW
<u>FLOYD</u>					
Allen Mun. Water Comm.	Beaver Creek	x		.048	.005
Francis Water Company	R. Fk. Beaver Creek	x		.033	
Kentucky Hydrocarbon	R. Fk. Beaver Creek	x			.186
Martin Municipal W. W.	Beaver Creek	x		.102	
Prestonburg Municipal Water Works	Levisa Fork	x		.356	
Beaver Elkhorn Water District		x	x	.150 GW Mar-May .159 SW June-Feb	
Island Creek Coal Co.	Beaver Creek	x			.257
<u>JOHNSON</u>					
Paintsville Municipal Water Works	Levisa Fork	x		.404	.101
Van Lear, Kentucky Water Company	Levisa Fork	x		.142	.003
<u>LAWRENCE</u>					
Louisa Municipal Water Works	Levisa Fork	x		.296	.197
<u>LETCHER</u>					
Jenkins, Kentucky Water Company	Elkhorn Lake	x		.578	.064
<u>PIKE</u>					
Feds Creek Coal Co.	Big Creek	x	x		.050 SW .005 GW
Kentland-Elkhorn Coal Company	Big Creek	x	x		.221 GW & SW
Elkhorn City Municipal Water Works	Russell Fk.	x		.066	
Pikeville Coal Company		x	x	.001 GW	.085 SW

Continued - J-9

Pikeville Municipal  
Water Works

Big Sandy

x

.641

.033

Shelbiana (C & O  
Railroad)

Levisa Fk.

x

.031

.058

\* SW = surface water  
\*\* GW = ground water